IN THE CLAIMS:

Amend the claims as follows.

2,3,6-9
15-20,23

1. (original) A system comprising a compound of the following formula (II):

$$A\text{-}CH(R_i)\text{-}NH\text{-}[CO\text{-}CH(R_k)\text{-}NH]_{j-i}\text{-}CO\text{-}CH(R_{j+1})\text{-}B \qquad (II)$$

wherein

n, which is the number of aminoacyl residues in formula I, is a whole number from 3-1,000, and R_i , R_k, and R_{j+1} are side chains of the aminoacyl residues,

i, j and k are whole numbers

wherein $1 \leq i \leq j < n$, and

if i=j, k=0; and

if $i < j$, $i + 1 \leq k \leq j$;

such that,

where $i = 1$ and $j + 1 = n$, A is Q and B is M;

where $i = 1$ and $j + 1 \neq n$, A is Q and B is L;

where $i \neq 1$ and $j + 1 = n$, A is T and B is M; and

where $i \neq 1$ and $j + 1 \neq n$, A is T and B is L;

Q being selected from the group consisting of H-, H_2N-, P-HN-, RR'N-, H_2NCO-, RR'NCO-, RCO-;

M being selected from the group consisting of H-, -COOH, -COOR, -$CONH_2$, -CONRR' and -NHCOR;

L being -CO-NH-CH(R_{j+2})-CO-...-NH-CH(R_n)-CO-Y

wherein Y is selected from the group consisting of -OH, -OR, -NH_2, and -NRR'; and

T being X-HN-CH(R_1)-CO-...-NH-CH(R_{i-1})CO-NH-

wherein X is selected from the group consisting of H-, P-, R- and RCO-;

wherein

R and R' are independently selected from the group consisting of hydrogen, C_{1-25} alkyl, C_{3-25} allyl, C_{6-25} aryl, benzyl, 2-phenyl-ethyl, methyl-fluorenyl, glycolamide and benzhydrylglycolamide; and

P is a protecting group;

said compound being an immunoretroid form of an immunologically active peptide which binds to an antibody or an antibody fragment directed against said immunologically active peptide with at least equal affinity as said immunologically active peptide;

said system further comprising at least one reagent, or components necessary to form said reagent, for forming an immune complex between said compound and said antibody or antibody fragment; and

optionally, a solid support for immobilizing said immune complex, and,

optionally, at least one reagent for detecting said immune complex.

2. (original) A vaccine comprising an immunoretroid form of an immunologically active peptide, said immunoretroid being a derivative of said peptide which binds to an antibody or an antibody fragment to said peptide with at least an equal affinity as said peptide; wherein said immunoretroid form is a retro-inverso peptide or a retro-peptide of a peptide, wherein said immunoretroid form of said peptide has the following formula II:

$$A\text{-}CH(R_i)\text{-}NH\text{-}[CO\text{-}CH(R_k)\text{-}NH]_{j\text{-}i}\text{-}CO\text{-}CH(R_{j+1})\text{-}B \qquad (II)$$

wherein

n, which is the number of aminoacyl residues in formula I, is a whole number from 3-1,000, and R_i , R_k, and R_{j+1} are side chains of the aminoacyl residues,

i, j and k are whole numbers

wherein $1 \leq i \leq j < n$, and

if i=j, k=0; and

if $i < j$, $i + 1 \leq k \leq j$;

such that,

where $i = 1$ and $j + 1 = n$, A is Q and B is M;

where $i = 1$ and $j + 1 \neq n$, A is Q and B is L;

where $i \neq 1$ and $j + 1 = n$, A is T and B is M; and

where $i \neq 1$ and $j + 1 \neq n$, A is T and B is L;

Q being selected from the group consisting of H-, H_2N-, P-HN-, RR'N-, H_2NCO-, RR'NCO-, RCO-;

M being selected from the group consisting of H-, -COOH, -COOR, $-CONH_2$, -CONRR' and -NHCOR;

L being $-CO-NH-CH(R_{j+2})-CO-\ldots-NH-CH(R_n)-CO-Y$

wherein Y is selected from the group consisting of -OH, -OR, $-NH_2$, and -NRR'; and

T being $X-HN-CH(R_1)-CO-\ldots-NH-CH(R_{i-1})CO-NH-$

wherein X is selected from the group consisting of H-, P-, R- and RCO-;

wherein

R and R' are independently selected from the group consisting of hydrogen, C_{1-25} alkyl, C_{3-25} allyl, C_{6-25} aryl, benzyl, 2-phenyl-ethyl, methyl-fluorenyl, glycolamide and benzhydrylglycolamide; and

P is a protecting group; and

said vaccine further comprising a physiologically acceptable vehicle.

3. (original) A vaccine comprising an immunoretroid form of an immunologically active peptide, said immunoretroid being a derivative of said peptide which binds to an antibody or an antibody fragment to said peptide with at least an equal affinity as said peptide; wherein said immunoretroid form is a retro-inverso peptide or a retro-peptide of a peptide selected from the group consisting of

- FP peptide from serotype A12 of foot-and-mouth disease virus,
- FL peptide from serotype A12 of foot-and-mouth disease virus,
- SL peptide from serotype A12 of foot-and-mouth disease virus,

site A of haemagglutinin of influenza virus,

peptide C18L of peptide HA91-108 of haemagglutinin of influenza virus,

peptide 9B1 of *Schistosoma mansoni*,

a mimotope of measles virus,

a cyclic peptide of human immunodeficiency virus glycoprotein 41,

a cytotoxic T-cell epitope of influenza virus matrix comprising epitope 56-68,

an auxiliary T epitope of tetanus toxin,

a poliovirus VP1 peptide, and

a physiologically acceptable vehicle.

4. (original) A method of treating an autoimmune disease comprising administering an immunoretroid form of an immunologically active peptide, said immunoretroid form comprising a compound of the following formula (II):

$$A\text{-}CH(R_i)\text{-}NH\text{-}[CO\text{-}CH(R_k)\text{-}NH]_{j\text{-}i}\text{-}CO\text{-}CH(R_{j+1})\text{-}B \qquad (II)$$

wherein

n, which is the number of aminoacyl residues in formula II, is a whole number from 3-1,000, and R_i , R_k, and R_{j+1} are side chains of the aminoacyl residues,

i, j and k are whole numbers

wherein $1 \leq i \leq j < n$, and

if i=j, k=0; and

if $i < j$, $i + 1 \leq k \leq j$;

such that,

where $i = 1$ and $j + 1 = n$, A is Q and B is M;

where $i = 1$ and $j + 1 \neq n$, A is Q and B is L;

where $i \neq 1$ and $j + 1 = n$, A is T and B is M; and

where $i \neq 1$ and $j + 1 \neq n$, A is T and B is L;

Q being selected from the group consisting of H-, H_2N-, P-HN-, RR'N-, H_2NCO-, RR'NCO-, RCO-;

M being selected from the group consisting of H-, -COOH, -COOR, -$CONH_2$, -CONRR' and -NHCOR;

L being -CO-NH-CH(R_{j+2})-CO-...-NH-CH(R_n)-CO-Y

wherein Y is selected from the group consisting of -OH, -OR, -NH_2, and -NRR'; and

T being X-HN-CH(R_1)-CO-...-NH-CH(R_{i-1})CO-NH-

wherein X is selected from the group consisting of H-, P-, R- and RCO-;

wherein

R and R' are independently selected from the group consisting of hydrogen, C_{1-25} alkyl, C_{3-25} allyl, C_{6-25} aryl, benzyl, 2-phenyl-ethyl, methyl-fluorenyl, glycolamide and benzhydrylglycolamide; and

P is a protecting group;

said compound being an immunoretroid form of an immunologically active peptide which binds to an antibody or an antibody fragment directed against said immunologically active peptide with at least equal affinity as said immunologically active peptide.

5. (original) An antibody or antibody fragment which binds with at least equal affinity to a peptide and an immunoretroid form of said peptide, said peptide being selected from the group consisting of

C-terminal epitope of protein histone H3,

FP peptide from serotype A12 of foot-and-mouth disease virus,

FL peptide from serotype A12 of foot-and-mouth disease virus,

SL peptide from serotype A12 of foot-and-mouth disease virus;

internal domain 277-291 of 52kD SSA/Ro protein,

internal domain 304-324 of 60kD SSA/Ro protein,

internal domain 28-45 of histone H3,

site A of haemagglutinin of influenza virus,

peptide C18L of peptide HA91-108 of haemagglutinin of influenza virus,

B1 peptide 9B1 of *Schistosoma mansoni*,

a mimotope of measles virus,

a cyclic peptide of human immunodeficiency virus glycoprotein 41,

a cytotoxic T-cell epitope of influenza virus matrix comprising epitope 56-68,

an auxiliary T epitope of tetanus toxin,

a poliovirus VP1 peptide, and

a peptide containing the third constant region of a mouse heavy chain IgG2a allopeptide $\gamma 2a^b$.

6. (original) The vaccine of claim 2 wherein said immunoretroid form of said immunologically active peptide is bound to a liposome.

7. (original) The vaccine of claim 2 further comprising an adjuvant.

8. (original) The vaccine of claim 3 wherein said immunoretroid form of said immunologically active peptide is bound to a liposome.

9. (original) The vaccine of claim 3 further comprising an adjuvant.

10. (original) A system for detecting a peptide comprising an antibody or antibody fragment specific for said peptide wherein said antibody or antibody fragment was produced by an immunological reaction with an immunoretroid form of said peptide wherein said peptide is selected from the group consisting of

C-terminal epitope of protein histone H3,

FP peptide from serotype A12 of foot-and-mouth disease virus,

FL peptide from serotype A12 of foot-and-mouth disease virus,

SL peptide from serotype A12 of foot-and-mouth disease virus;

internal domain 277-291 of 52kD SSA/Ro protein,

internal domain 304-324 of 60kD SSA/Ro protein,

internal domain 28-45 of histone H3,

site A of haemagglutinin of influenza virus,

peptide C18L of peptide HA91-108 of haemagglutinin of influenza virus,

peptide 9B1 of *Schistosoma mansoni*,

a mimotope of measles virus,

a cyclic peptide of human immunodeficiency virus glycoprotein 41,

a cytotoxic T-cell epitope of influenza virus matrix comprising epitope 56-68,

an auxiliary T epitope of tetanus toxin,

a poliovirus VP1 peptide, and

a peptide containing the third constant region of a mouse heavy chain IgG2a allopeptide $\gamma 2a^b$;

said immunoretroid form being a retro-inverso or a retro- form of said peptide;

said system further comprising at least one reagent, or components necessary to form said reagent, for forming an immune complex between said antibody or antibody fragment and said peptide; and

optionally, a solid support for immobilizing said complex, and,

optionally, at least one reagent for detecting said immune complex.

11. (original) An immunological method of detecting lupus in an individual suspected of having lupus comprising contacting an immunoretroid form of a C-terminal hexapeptide of histone H3 with a biological sample from said individual under conditions where an immune complex comprising said immunoretroid form and an antibody specific to said C-terminal hexapeptide of histone H3 in said sample will form, if present; and

detecting said complex, wherein said complex, when present, is indicative of said individual having lupus.

12. (original) An immunological method of detecting one of disseminated lupus erythematosus and Sjögren's syndrome in an individual suspecting of having one of disseminated lupus erythematosus and Sjögren's syndrome comprising contacting an immunoretroid form of at least one of internal domain 304-324 of 60kD SSA/Ro protein and internal domain 277-291 of 52kD SSA/Ro protein, with a biological sample from said individual under conditions where an immune complex comprising said immunoretroid form and an antibody specific to said protein will form, if present; and

detecting said complex, wherein said complex, when present, is indicative of said individual having one of disseminated lupus erythematosus and Sjörgen's syndrome.

13. (original) A system of claim 1 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

14. (original) A system of claim 1 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.

15. (currently amended) A ~~system~~vaccine of claim 2 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

16. (currently amended) A ~~system~~vaccine of claim 2 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.

17. (currently amended) A ~~system~~vaccine of claim 7 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

18. (currently amended) A ~~system~~vaccine of claim 7 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.

19. (currently amended) A ~~system~~vaccine of claim 9 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

20. (currently amended) A ~~system~~vaccine of claim 9 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.

21. (original) An immunological method of detecting an antibody or antibody fragment which binds to an immunologically active peptide comprising contacting a sample suspecting of containing said antibody or antibody fragment with an immunoretroid form of said peptide under conditions where an immune complex between said immunoretroid form and said antibody or antibody fragment will form, if said antibody or antibody fragment is present; and

detecting said complex;

said immunoretroid form comprising a compound of the following formula (II):

$$A\text{-}CH(R_i)\text{-}NH\text{-}[CO\text{-}CH(R_k)\text{-}NH]_{j\text{-}i}\text{-}CO\text{-}CH(R_{j+1})\text{-}B \qquad (II)$$

wherein

n, which is the number of aminoacyl residues in formula I, is a whole number from 3-1,000, and R_i , R_k, and R_{j+1} are side chains of the aminoacyl residues,

i, j and k are whole numbers

wherein $1 \leq i \leq j < n$, and

if i=j, k=0; and

if $i < j$, $i + 1 \leq k \leq j$;

such that,

where $i = 1$ and $j + 1 = n$, A is Q and B is M;

where i = 1 and j + 1 ≠ n, A is Q and B is L;

where i ≠ 1 and j + 1 = n, A is T and B is M; and

where i ≠ 1 and j + 1 ≠ n, A is T and B is L;

Q being selected from the group consisting of H-, H_2N-, P-HN-, RR'N-, H_2NCO-, RR'NCO-, RCO-;

M being selected from the group consisting of H-, -COOH, -COOR, -$CONH_2$, -CONRR' and -NHCOR;

L being -CO-NH-CH(R_{j+2})-CO-...-NH-CH(R_n)-CO-Y

wherein Y is selected from the group consisting of -OH, -OR, -NH_2, and -NRR'; and

T being X-HN-CH(R_1)-CO-...-NH-CH(R_{i-1})CO-NH-

wherein X is selected from the group consisting of H-, P-, R- and RCO-;

wherein

R and R' are independently selected from the group consisting of hydrogen, C_{1-25} alkyl, C_{3-25} allyl, C_{6-25} aryl, benzyl, 2-phenyl-ethyl, methyl-fluorenyl, glycolamide and benzhydrylglycolamide; and

P is a protecting group;

said compound being an immunoretroid form of an immunologically active peptide which binds to an antibody or an antibody fragment directed against said immunologically active peptide with at least equal affinity as said immunologically active peptide.

22. (original) A method of treating an autoimmune disease according to claim 4,. wherein said immunologically active peptide is an autoreactive T cell antigonist peptide

selected from the group consisting of a poliovirus VP1 peptide and a peptide containing the third constant region of a mouse heavy chain IgG2a allopeptide $\gamma 2a^b$.

23. (original) A vaccine according to claim 3, wherein said peptide is selected from the group consisting of

— FP peptide from serotype A12 of foot-and-mouth disease virus,

— FL peptide from serotype A12 of foot-and-mouth disease virus,

— SL peptide from serotype A12 of foot-and-mouth disease virus,

— site A of haemagglutinin of influenza virus.

24. (original) An antibody of claim 5, wherein said peptide is selected from the group consisting of

C-terminal epitope of protein histone H3,

FP peptide from serotype A12 of foot-and-mouth disease virus,

FL peptide from serotype A12 of foot-and-mouth disease virus,

SL peptide from serotype A12 of foot-and-mouth disease virus;

internal domain 277-291 of 52kD SSA/Ro protein,

internal domain 304-324 of 60kD SSA/Ro protein,

internal domain 28-45 of histone H3,

site A of haemagglutinin of influenza virus.

25. (original) A system of claim 10, wherein said peptide is selected from the group consisting of

C-terminal epitope of protein histone H3,

FP peptide from serotype A12 of foot-and-mouth disease virus,

FL peptide from serotype A12 of foot-and-mouth disease virus,

SL peptide from serotype A12 of foot-and-mouth disease virus;

internal domain 277-291 of 52kD SSA/Ro protein,

internal domain 304-324 of 60kD SSA/Ro protein,

internal domain 28-45 of histone H3,

site A of haemagglutinin of influenza virus.